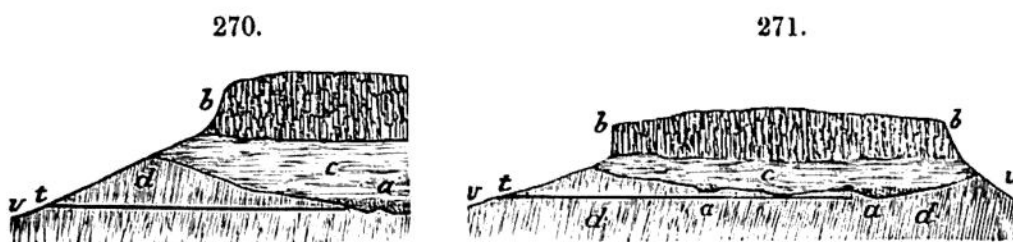


the Yellowstone Park down the Snake River region. It spreads north over Oregon and Washington. There are many other areas over the Great Basin, to the south. No cones exist as centers of these floods of lavas, but to the west are lofty volcanoes of the Cascade Range. In the Great Basin the lavas of the areas are commonly rhyolite.

The two following figures are examples of surficial outflows and of parts of Table Mountain, Cal., which resulted therefrom through denudation. The melted rock flowed over the gravels and river-beds of the country, and thus obliterated the old surface features. Subsequently erosion by waters, cutting through the igneous layers, and then through the easily removable beds beneath, left a flat-topped elevation. Such "table mountains," or *mesas*, are



Sections of Table Mountain, Tuolumne County, Cal.: 270, at Maine Boys' tunnel; 271, at Buckeye tunnel. J. D. Whitney.

common in California, Arizona, and some other parts of the Rocky Mountain area. These fissures, as explained by Whitney, show the *old*, now buried, river valley (cut out of tilted Sierra schists, *d*), holding in the river bed (at *a*, *a*) auriferous gravel, and, above, finer fluvial deposits (*c*), which often are partly volcanic ash, and sometimes contain silicified stumps and logs; and, over all, the cap of basalt (*b*); *bv* is part of the outline of the adjoining *modern* valley. Tunnels (*t*) are made through the "rim-rock" of such old valleys to reach the gravel, the gold being collected in these bottom deposits because of its weight.

A stream of melted rock usually hardens more or less the bed of sedimentary rock over which it flows; or it bleaches, blackens, or otherwise changes it. Should it change, in like manner, an overlying bed, this would be evidence that the stream was not surficial but interstitial; that is, an intrusion between two layers. The hardening effects often fail, however, because there was no moisture present; for dry sands cannot be hard baked. Moreover, coarse pebbly beds are consolidated more readily than shales, because they let the steam, that may be generated from moisture, pass through them, when the fine earthy beds do not. Hence the latter may show little or no evidence of the heat. On these changes see further under Metamorphism, page 312.

4. *Interstitial outflows*. — The intrusion of the melted rock of a fissure between the layers of the stratified formation it intersects may be either a simple gravitational flow; or a forced flow.

(*a*) The melted rock will naturally flow from a fissure into any opened